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MILDEW OF CEREALS

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Trans. All-Union Inst. of Plant Protection

M. A. Elbakyan

In recent years, increasing occurrence of powdery mildew (*Erysiphe graminis* DC) on cereal grasses has been noted. In 1964 the disease was found throughout most oblasts within the European USSR, and at some sites in Siberia, Altai and the Far East. Wheat, rye, barley, oats, and wild cereal grasses were affected. Thus, in Atkarskiy Rayon of Saratovskaya Oblast, within the surveyed area of 11,966 hectares, all of the winter- and summer-wheat plants were infected with the disease to some extent. In the Checheno-Ingushskaya ASSR the disease was observed on 43,252 hectares; in the Severo-Osetinskaya ASSR on 7,633 hectares.

On winter wheat the disease started to develop from the beginning of the vegetative period, in April - May (L'vovskaya, Poltavskaya, Donetskaya, Volgogradskaya, and other oblasts) or in June (Leningradskaya, Moscow, Ivanovskaya, Gor'kovskaya, Ul'yanovskaya, and other oblasts). The data on prevalence of the disease are listed in the accompanying Table.

In a number of instances the disease became widespread from the springtime on, up to epiphytic proportions; later on, after the dying of the lower leaves and owing to the relatively dry and warm weather the disease showed no further progress. In Cherkasskaya Oblast, for example, during the second ten-day period of June there remained only 4% of infected plants, whereas in the spring their number had amounted to about 70%. In Poltavskaya Oblast, the occurrence of powdery mildew decreased from 62 to 5-10% over the period extending from tillering to the milky maturation of the grain. However, in a number of oblasts (Zaporozhskaya, Rostovskaya, Donetskaya, Sumskaya, Dnepropetrovskaya and Kiyevskaya), in the Severo-

Osetinskaya ASSR, and in other administrative districts, powdery mildew progressed during the entire vegetative period of the wheat and occurred chiefly in the dense stands and over areas of low-lying land.

The disease caused appreciable yield losses in the Bryanskaya, Dnepropetrovskaya, and some other oblasts. Of major importance to disease occurrence were the cropping predecessors: the causative agent affected the wheat more extensively on those areas where it had been grown for several years in succession (Dnepropetrovskaya Oblast). Thus, in the Checheno-Ingushskaya ASSR under such conditions all of the plants were heavily infected, while those grown in rotation with peas and corn were infected only to the extent of 30%.

A slight occurrence of the disease on winter wheat was observed in the Rovenskaya (up to 5%), Vinnitskaya (up to 9%) and Kurskaya (up to 16%) oblasts, as well as in the central and southern regions of northwestern zone of the USSR.

On summer wheat the causative agent of the disease was very strongly manifested in the non-chernozem zone of the USSR in Europe (Leningradskaya, Ivanovskaya, Yaroslavskaya, and other oblasts), in the northern part of the Volga region, and also in the Kuybyshevskaya and Saratovskaya oblasts. The most severe, generally distributed, infection was found in the Bashkirskaya ASSR.

On barley, the disease was found to be quite widespread in the Lithuanian SSR, Krasnodarskiy Kray, Zhitomirskaya, Chernigovskaya, Alma-Atinskaya, and other oblasts. In the Zaporozhskaya Oblast, over one area (143 hectares) the plants were somewhat stunted by the disease. This resulted in a yield decrease by 3.6 centners per hectare.

Focal areas of severe infection of rye were found in the Bashkirskaya ASSR, and the Kuybyshevskaya and Poltavskaya oblasts.

Oats were found to be infected to a considerable extent with powdery mildew in the northwestern zone and at some places in the Ukraine.

Percentage loss of the yield of oats and barley (L_y) due to powdery mildew can be computed by using the formula:

$$L_y = 2.5 \cdot \sqrt{\text{percentagewise degree of infection}}$$

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The percentagewise degree of infection is calculated on the basis of determination of the surface area covered by pustules of the fungus on the 4 uppermost leaves; determinations of percentagewise degree of infection of the plants are made during the period between earing up and beginning of maturation (E. C. Large, D. A. Doling, 1962).

The extent of powdery mildew occurrence is determined in many instances by the amount of fungal infective agent present on the winter-crop plants in the autumn. From these data the Workers of STAZRA* can make, by taking into account the spring-time meteorological conditions, a forecast of the local development of the disease.

*STAZRA = Plant Protection Station

**Data on Severe Infection of Winter Wheat with Powdery Mildew
in 1964**

| 1 Республика, край, область | 2 Процент пораженных растений | 3 Степень поражения | 1 Республика, край, область | 2 Процент пораженных растений | 3 Степень поражения |
|---------------------------------|----------------------------------|------------------------|--------------------------------|----------------------------------|------------------------|
| 4 Брянская обл. | 100 | 26 Слабая | Липецкая обл. | 15 | 100 Очажно сплошная |
| 5 Волгоградская обл. | 11 | 27 Очажно средняя | Липецкая обл. | 16 | 85 Очажно средняя |
| 6 Воронежская обл. | 92 | 26 Слабая | Московская обл. | 17 | 100 Средняя |
| 7 Владимирская обл. | 40 | 28 Средняя | Одесская обл. | 18 | 46 Слабая |
| 8 Гомельская обл. | 100 | 29 Очажно сильная | Полтавская обл. | 19 | 62 Средняя |
| 9 Днепропетровская обл. | 100 | 29 Очажно сильная | Саратовская обл. | 20 | 100 Очажно сильная |
| 10 Житомирская обл. | 100 | 28 Средняя | Сумская обл. | 21 | 100 Слабая |
| 11 Ивановская обл. | 100 | 30 Сильная | Татарская АССР | 22 | 100 Слабая |
| 12 Калужская обл. | 63 | 26 Слабая | Харьковская обл. | 23 | 100 Слабая |
| 13 Краснодарский край | 80 | 29 Очажно сильная | Черкасская обл. | 24 | 80 Средняя |
| 14 Ленинградская обл. | 100 | 28 Средняя | Черниговская обл. | 25 | 27 Сильная |

Legend: 1) Republic, kray, oblast; 2) Percentage of infected plants; 3) Degree of infection; 4) Dryanskaya Oblast; 5) Volgogradskaya Oblast; 6) Voronezhskaya Oblast; 7) Vladimirskaya Oblast; 8) Gomel'skaya Oblast; 9) Dnepropetrovskaya Oblast; 10) Zhitomirskaya Oblast; 11) Ivanovskaya Oblast; 12) Kaluzhskaya Oblast; 13) Krasnodarskiy Kray; 14) Leninskaya Oblast; 15) Lipetskaya Oblast; 16) L'vovskaya Oblast; 17) Moscow Oblast; 18) Odesskaya Oblast; 19) Poltavskaya Oblast; 20) Saratovskaya Oblast; 21) Sumskaya Oblast; 22) Tatarskaya ASR; 23) Khar'kovskaya Oblast; 24) Cherkasskaya Oblast; 25) Chernigovskaya Oblast; 26) Mild; 27) Moderate, focal; 28) Moderate; 29) Severe, focal; 30) Severe